

A SOLUTION TO LOCKDOWN PANIC BUYING WITH THE HELP OF GAME THEORY

By Nitya Bothra¹

INTRODUCTION

The recent hastily imposed lockdowns by various countries in the backdrop of Covid-19 pandemic brought to fore the curious phenomenon of ‘panic buying’. There were news reports of food items, hand sanitizers, masks, and various other fast moving consumer goods being stocked out as people rushed to their nearest supermarkets. Panic buying is a phenomenon² or herd behaviour which occurs when consumers buy unusually large amounts of a product such as food, fuel, etc. in the anticipation of, or after, a disaster or perceived disaster, or in anticipation of a large price increase or shortage. It has a potential to impact vulnerable populations due to underlying socio-economic inequalities being exacerbated by the pandemic. One way to counter this phenomenon is via the application of ‘game theory’.

Game theory can also be considered as a “*study of ways in which interacting choices of economic agents produce outcomes with respect to the preferences of those agents, where the outcomes in question might have been intended by none of the agents*” There are various types of games based on the number of players as well as perfect and imperfect information in the market.

STATEMENT OF THE PROBLEM

The pandemic induced crisis of selfish behaviour and greed and fear of being left with nothing has caused the consumers to choose based on “sucker’s payoff” which in turn has caused a disparity between the hoarders and those left with nothing. Sucker’s payoff is the concern that if a consumer shops sparingly, they will end up with the worst outcome while others benefit

¹ IInd year student, Gujarat National Law University, Gandhinagar.

² *Panic Buying*, Cambridge Advanced Learner’s Dictionary & Thesaurus.

through hoarding¹. This has also caused a hike in prices of commodities such as toilet paper and various other basic necessities around the globe. Toilet paper panic buying could be seen rampant in United States of America, Australia, Japan, Hong Kong, Germany among others.

In times of crisis such as the present COVID '19 pandemic, the decision of buying supplies in a socially responsible manner does not depend only on the consumer and their choice but also depends on the choices of other consumers.

APPLICATION OF GAME THEORY

Game theory is based on the assumption that people have stable preferences and that their choices are based upon choosing the alternative from a given set of alternatives that are ranked highest under these preferences. Game theorists assume that players have sets of capacities that are typically referred to in economics as comprising 'rationality'. The game is a deliberate approximation, designed to include important aspects of the interaction and exclude unimportant ones.

The actions "cooperate" and "defect" are approximations of alternatives that may be much more complex. Cooperation may involve colluding in an oligopoly market or signing a treaty or an agreement, while defection may involve flooding the market with increased output or simply defying traffic rules. A "saddlepoint" in a two-person constant-sum game is the outcome that rational players would choose. Saddlepoint always exists in a game of perfect information and may or not exist in a game with imperfect information². The player tends to choose a strategy associated with the outcome where each player obtains an amount at least equal to his payoff, not considering the choices and strategy of the other player. Thus, when saddlepoints exist, optimal strategies and outcomes are easier to be determined and followed. There always exists the possibility of there being no equilibrium or saddlepoint, thus, there being no compelling solution to the game. For panic-buying to be reduced or eliminated, the government must strive to achieve this saddlepoint and push the citizens, the players of the game, towards it.

¹ Rodney Lay, *The Lessons from Toilet Paper Panic Buying*, Live Wire, (Mar. 20, 2020), <https://www.livewiremarkets.com/wires/the-lessons-from-toilet-paper-panic-buying>.

² Larry Samuelson, *Game Theory in Economics and Beyond*, 30 *Journal of Eco Perspectives* 107 (2016).

ANALYSIS OF DATA

Panic buying occurs due to various factors of which the most prominent according to various studies are:

- 1. Lack of trust:** When there is a reduction of people's faith and trust in market institutions, government and administration and the private sector, versions of truths, half-truths and rumours. This lack of trust is caused by insufficient and incomplete information in the market. In a market with perfect competition and perfect information, the consumer is less likely to do panic buying due the factors like price hike and fear of other consumers' choices¹.
- 2. Fear:** Fear caused due to a pandemic or any event that is out of control of human beings tends to cause irrational behaviour. This fear can be mitigated through spreading proper information of how long the lockdown will last and rationing the supplies given to each individual or family.
- 3. Tendency to avert losses:** Human beings have a tendency to avoid future losses and in times of instability in terms of prices and quantity of essential products, human beings exhibit panic buying.
- 4. Influence by others:** Influence by role models to buy items leads to panic buying in various consumers as well. This could be used as an alternative strategy by asking role models to influence people to not panic buy.
- 5. Greed:** It can also be seen that certain opportunists buy necessities such as toilet paper and sanitisers in the current pandemic, only to sell it at much higher prices later.

Several factors tend to mediate the response of a group and mitigate the herd mentality as well. These factors² are:

¹ Steven Brams, Morton Davis, *Game Theory*, Britannica, (Jan. 10, 2020), <https://www.britannica.com/science/game-theory>.

² Chris Stiff, *The game theory of panic-buying – and how to reduce it*, The Conversation, (Mar. 31, 2020, 09:37 PM), <https://theconversation.com/the-game-theory-of-panic-buying-and-how-to-reduce-it-134107>.

- 1. Food Prices:** People tend not to be afraid if the food prices don't inflate and thus, not fear to lose or face the sucker's payoff.
- 2. Purchasing Power:** It refers to the ability of the consumer to buy certain items. Those with purchasing power such as the upper class and middle class are those which can afford to panic buy.
- 3. Information and awareness:** Making consumers aware and giving them access to information regarding supply chains, ability of markets, delivery statuses and present stocks helps when communicated properly.

RECOMMENDATIONS FOR POLICY MAKING

There are a few methods that can be adopted such as:

- 1. Increasing cooperation:** When the perception of the consumers shifts from that of needing the supplies out of fear and greed to all consumers being faced with the same problem, panic buying tends to reduce. Mutual gain occurs in the present situation and thus, cooperation is effective in bringing equitable distribution.
- 2. Promoting discussion and spreading awareness:** In certain games it can be helpful as all players are facing similar situations and choices. Promoting discussion and conversation helps improve relationships between consumers and increases information¹. Panic buying occurs due to selfish impulses of the consumers which reduce when information is spread and discussion of similar situations of the consumers is present. This would also increase trust between the various players of the game and increase benefit to all.
- 3. Preference to needy:** Various supermarkets have made it a point to open the stores for an hour only for the elderly in order to help them in this crisis situation as they are the most affected by the pandemic. This leads to equitable distribution of resources.

¹ Don Ross, *Game Theory*, The Stanford Encyclopedia of Philosophy, (Jan. 25, 1997), <https://plato.stanford.edu/archives/win2019/entries/game-theory/>.

4. **Deterrent punishment:** Social sanctions such as naming and shaming those who hoard are often effective. Direct punishment such as fines or penalties can also be strong deterrents. Rationing the supplies and enforcing this through effective punishments can be extremely useful to reduce greed and selfishness amongst consumers.

In the methods discussed above, the herd mentality of panic-buying can be controlled and thus, equitable distribution can be restored. This will also help in flattening the curve and help in the possible stop of the spread of COVID '19. It would also help provide the much-needed equipment to the medical staffers and aid the recovery of the patients that are increasing by the minute.